Epidemiology of *Salmonella* in Swine Production Systems in North Carolina

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SYNOPSIS OF WORK

Background: Program initiated in 1994 when Dr. Davies joined the College of Veterinary Medicine, NCSU.
Long term goal: to make a major contribution to knowledge of the epidemiology, in swine production systems, of foodborne pathogens of humans.

Projects and Sources of Funding (Title, Source, Time-frame, status):
1. Effects of emerging swine production systems on the prevalence of *Salmonella* and *Toxoplasma gondii* in pigs. NPPC. July 1994-June 1995. (completed 9/95).

Cross-sectional study of the prevalence of *Salmonella* spp. (and *Toxoplasma/Trichinella*) in market-age swine in different production systems in North Carolina. Twenty nine herds were included in the study. Herds purposely selected by overall production system. Group A: 14 finisher barns using all-in/all-out management by building. Seven farms with fully slotted floors (SF), 7 with solid floors and open flush gutters (OFG). Group B: 14 farrow-to-finish herds with continuous flow finishing barns. Seven (+1 university herd) herds-total confinement, 7-finishing pigs some access to outside accommodation (3 on dirt, 3 on concrete, 1 on pasture).

Twenty-four of 29 farms were positive (at least one *Salmonella* isolated). Salmonellae were isolated from 594 (26%) of 2326 individual fecal samples. Among positive herds, prevalence ranged from 2% to 88% of fecal samples. The 6 serotypes found on the most number of farms were *S. derby, S. worthington, S. typhimurium, S. typhimurium (copenhagen), S. heidelberg,* and *S. mbandaka.* Several of these serotypes are among the most common isolates from cases of clinical disease in humans in the U.S. *Salmonella choleraesuis*, the most common isolate from clinical cases in swine in the U.S. was isolated from only 6 samples on 2 farms.

2. Longitudinal studies of *Salmonella* infection of swine in multiple-site production systems. North Carolina Pork Producers Association/NPPC. 1995-98.

Objectives: 1) identify points in the pork production cycle when infection with *Salmonella* occurs 2) identify likely key sources of infection 3) evaluate the stability of these observations over time within herds. Sampling of pigs will focus on repeated sampling from individual animals over time. In breeding herds, one group of newly arrived gilts will be repeatedly sampled over two years. At nursery and finisher sites, observations will be replicated in 3 groups raised in the same facilities. Intensive sampling of all animals in randomly selected pens combined with random sampling from other pens within the same buildings and in other buildings on the same sites. Also feed, water and environmental samples (including trapped rodents and liquid from flushing tanks) at each visit.

Field work initiated - no results available

3. Other initiatives (unfunded):

a) Evaluation of delayed secondary enrichment and delay in processing on the recovery of *Salmonella* from fecal samples (being conducted)

4. Future Objectives

1) Evaluation of epidemiological markers for studying *Salmonella* in swine populations